

kept alive some days while encamped. They made a plaintive whistling noise, and when turned out fed all round the hut, and returned towards dusk, when we whistled for them; they became quite tame.

XXV—*Field-Notes on the Birds of the Island of San Domingo.* By Dr. CUTHBERT CHRISTY.

At the beginning of January, 1895, I landed at the famous old city of Santo Domingo, the capital of San Domingo, and, after spending a day and a half among the picturesque ruins of old houses and fortifications and other places of interest, steamed away for Sanchez, where we arrived a day and a half later. This little town of ten years' growth (Las Cañitas of the old maps) is situated at the east end of San Domingo, at the head of Samaná Bay. It is the port and the headquarters of the Samaná and Santiago Railway Company, which runs west as far as La Vega, a distance of about 70 miles. From these two points, Sanchez and La Vega, all my collections were made. I left the island again in July, 1895, returning home *viá* New York.

The port of Sanchez stands in a very healthy situation at the foot of a densely-wooded range of hills which bounds Samaná Bay on the north, and continues along the north of the island. The south shore of the bay is a mass of honeycombed white coral rocks, forming picturesque inlets and islands densely covered with trees and matted vegetation, but singularly devoid of bird-life, except Pelicans and some of the Ardeidæ, which resort to the islands to breed.

At the head of the bay, commencing a mile or so to the west of Sanchez, is a vast morass, some 20 square miles in extent, really the delta of the river Yuna, which drains the great "Vega Real" of Columbus. In this morass the ornithologist finds a rich avifauna, and I look back with feelings of pleasure to the several excursions I made into it. It can,

I believe, be entered only in a boat by one very narrow creek, about three miles up the Yuna, on the north bank.

At La Vega, where I spent the greater part of April and May, the country is very different. There it is flat and more thickly populated, while there are many large plantations of cacao as well as of some coffee. The forest is not so dense, and is intersected by open patches of coarse grass, called "savanas."

Three miles to the south of the town are the slopes of the Cibao mountains, which run the whole length of the island and contain some peaks which are said to be of an altitude of over 10,000 feet. Except for the exertions of Baron Eggers, and later on of Mr. C. B. Cory, the higher parts of this range are as yet almost virgin ground to the naturalist.

During my stay in the island I was engaged almost continually in medical work, and therefore had very little time for collecting and skinning. But I managed to make many fruitful excursions, and I had often to ride long journeys to see patients, on which occasions I always carried some skinning-tools and my walking-stick gun, as well as a net and collecting-bottles. The walking-stick gun was invaluable, and I obtained most of my specimens with it; but it was a source of trouble on several occasions, owing to covetousness on the part of divisional commissaries of police. Once it was taken away from me by a commissary and six soldiers, but the governor, to whom I sent, returned it to me with the request that I would not use it near the town, for if the merchants took it into their heads to import such a weapon, the next revolution might be a dangerous affair. After that my house was broken into by a commissary in broad daylight, but the gun was carefully hidden. An apology was made to me, and the man was locked up.

I succeeded in making in all about 70 skins, and after carefully identifying the species, with the kind assistance of Mr. Salvin and Dr. Bowdler Sharpe, I find that there are none which have not been more or less fully described by Mr. Cory and others, although there are representatives of a few rare species and some interesting plumages among

them. I have therefore avoided needless description and the subject of nomenclature, confining myself almost entirely to recounting my observations of the habits and mode of life of the different species, a subject upon which practically nothing seems to have been written. I have added occasional notes upon nidification, measurement, contents of stomach, and the state of testes or ovaries.

I had previously studied to some extent the birds of South America, having spent some time in the Argentine; but I knew nothing of North-American birds, and I had only Mr. Cory's book on the birds of Hayti and San Domingo to help me in identification.

+1. *MIMOCICHLA ARDESIACA*. Locally "Flautero."

(Cory, op. cit. p. 18.)

This species has a loud flute-like song, hence its local name. I found it pretty common at La Vega, but it was shy, and usually met with in the thicker parts of the forest. In an adult male, shot at Sanchez on Feb. 25, I found the testes were the size of peas. The stomach was full of black pimento-seeds and their pulp. In another specimen, an adult female, shot April 14, I found the stomach contained a lizard and several lizard's eggs. On May 17 I shot a male nestling.

There was no proper gizzard in these birds. The mucous membrane of the stomach was very thick, but soft and unusually separable from the thin muscular wall of the organ—an arrangement which suggested that in order to digest its food the bird required a more liberal supply of blood to the stomach than most other birds of its class: in fact, it was a stomach not unlike that of the carnivorous birds.

+2. *MIMUS DOMINICUS*. Locally "Ruisseñor."

(Cory, op. cit. p. 21.)

This is the Mocking-bird of San Domingo, and a really magnificent songster. It is a species peculiar to the island, and I found it common both at Sanchez and La Vega. Seated on the top spike of a royal palm, it pours out its glorious song for twenty minutes or half an hour at a time

throughout the greater part of the day. Compared with that of our English birds, the song is distinctly Thrush-like, but far more continuous, varied, and beautiful.

There is little or nothing of the bird's mocking-habits to be detected in its song in the wild state, but when caged there seems to be no limit to its powers of mimicry. It copies the whistles, the songs, and the various noises to be heard in the streets, the barking of a dog, the neighing of a horse, and the songs of other birds, all the while sitting still on its perch till it catches one's eye; then, as it hops about its cage in a restless sort of manner, it suddenly comes out with one of its best imitations, and when one turns away will probably begin to pour out its own well-known song, as if in hopes of detaining one a little longer. The natives are very fond of rearing this bird from the nest, and when so reared I think the Ruiseñor must truly be one of the most interesting and companionable of all cage-birds.

A nestling was brought to me as early as March 7, and I saw young in the nest in April. On May 16, at La Vega, I shot an adult male, one of a pair whose nest with three eggs I found close by. It was built about two feet from the ground, concealed among the young shoots growing from the stump of a felled tree in a clearing. The nest and eggs that I saw were not unlike those of our Missel-Thrush, but the nest is very variable. When placed, as it often is, at the end of a branch of an orange- or other tree, 10 or 15 feet from the ground, and frequently quite close to a house, it is small, flat, and with untidy twigs sticking out in all directions.

3. *DENDRÆCA CORONATA*.

(Cory, op. cit. p. 30.)

Common among the scrub-willow and undergrowth on the banks of the river Yuna and in the Sanchez district, but I rarely observed it in the interior. Of two specimens obtained, an adult male was shot on Feb. 19 and another Feb. 27.

4. *DENDRÆCA PALMARUM.*

(Cory, op. cit. p. 32.)

An adult male collected on Jan. 28 near Sanchez. This species may have been as common as the previous one, but I was unable to distinguish them on the wing.

5. *SEIURUS AURICAPILLUS.*

(Cory, op. cit. p. 34.)

An adult female (length $5\frac{1}{2}$ inches) which I shot near to La Vega on April 19 was so extraordinarily fat that I had the utmost difficulty in preparing it and in separating the masses of oily fat from the tissue-paper-like skin.

6. *GEOTHYLPIS TRICHAS.*

(Cory, op. cit. p. 36.)

This graceful little bird, with its characteristic yellow-tinted throat, I only observed once or twice. On April 19 I shot a female (length 5 inches, stretch $6\frac{1}{2}$) at La Vega.

7. *SETOPHAGA RUTICILLA.*

(Cory, op. cit. p. 40.)

The only specimen I obtained of this species was a male from near Sanchez.

8. *CERTHIOLA BANANIVORA.* Locally "Seguitta de Savana," or, by the St. Thomas negroes, the "Beanflower-picker."

(Cory, op. cit. p. 41.)

This little bird, peculiar to the island, I saw several times at Sanchez. A male was brought to me there on Feb. 29, and I shot another male (length 4 inches, stretch $6\frac{3}{4}$) at La Vega on May 2. The tongue of this species is interesting, It is similar to the tongue of the Humming-birds, but far more specialized, being like a long, thin, fine, camel's-hair brush. One would think that a tongue like this could do nothing more than pick up from the interior of flowers the little drops of thin syrup by capillary attraction. I unfortunately omitted to examine the contents of the stomachs of those I skinned, but I have no doubt that the bird does feed on insects as well as syrup, for Mr. Cory remarks:—"At Le Coup (San Domingo) we observed it daily running about

the trunks of the banana-trees." The few times I observed the bird it was peeping into flowers; but this, of course, would not prove that the bird was feeding on syrup only, for we know that the Humming-birds feed mainly on insects, although they seem to be sucking honey from the flowers all the time.

This species certainly has the head and beak and actions of a Creeper, but it should be noted that it has neither the stiff tail nor the feet of that genus.

+9. *HIRUNDO SCLATERI*.

(Cory, op. cit. p. 45.)

Swallows were common at La Vega, and I believe they all belonged to this species, but I failed to preserve a specimen. I observed none elsewhere than at La Vega.

+10. *DULUS DOMINICUS*. Locally "Palm-Sparrow."

(Cory, op. cit. p. 51.)

A very common bird, peculiar to the island, breeding in colonies in nearly every grove of royal palms.

The nests are sometimes very large, quite an armful of twigs, interwoven into a compact mass in the head of the palm or on the cluster of berries just below the head. In this ball of sticks there are generally three or four nests, merely burrows into the side of the mass, the end lined with finer twigs; but what the eggs were like I did not discover. This bird is peculiar in its habits in many ways. It possesses most powerful legs, feet, and bill, and the size of the sticks which I have seen it break off and carry up to the palm-trees has often astonished me. One soon knows when one is in the vicinity of a colony, for the birds are noisy, with a very aggressive way about them, and at intervals they set up a most tremendous racket, every bird in the colony suddenly, as if at a given signal, making as much noise as possible. This lasts for about ten seconds or so, and then stops as suddenly as it began. I rather think that this may go on all day, whether anyone is in their neighbourhood or not, but I never could make sure. A female shot May 2 at La Vega measured—length $7\frac{1}{2}$ inches, stretch $10\frac{1}{4}$.

11. SPINDALIS MULTICOLOR.

(Cory, op. cit. p. 54.)

Another bird peculiar to the island, although, like certain other species, it somewhat resembles its Jamaican and Cuban relatives. The only one I observed was a female (length $6\frac{1}{2}$ inches), which I shot on Feb. 25 in the forest to the north of Sanchez.

Its stomach was full of soft dark purple seeds. The juice of these seeds stained the mucous membrane of the stomach and intestines almost black, and oozed from the vent and mouth. The food of these rare birds is evidently very soft, as there was no proper gizzard, only the soft thin stomach-wall.

12. PHENICOPHILUS PALMARUM.

(Cory, op. cit. p. 56.)

Peculiar to the island. I found this bird common both at Sanchez and La Vega. They are rather skulking in their habits. Sometimes the woods resound with their squeakings, and yet not one can be seen. In July a boy at Sanchez brought me five specimens, which unfortunately I had no time then to skin. One of these had the streak over the eye bright yellow instead of white, but otherwise the markings were normal. This I think now must have been a young bird, for on looking over those in the British Museum collection I find that one of them, an immature specimen, has the two spots on the forehead tinged with yellow and some yellow feathers on the throat.

Of other specimens obtained, a male shot on Feb. 19 at Sanchez had testes the size of peas, and a female shot on Feb. 10 measured $7\frac{1}{4}$ inches.

+13. CALYPTOPHILUS FRUGIVORUS.

(Cory, op. cit. p. 59.)

Peculiar to the island and rare, according to Cory. I met with it only once, on April 19, when I shot a male (length 8 inches, stretch $10\frac{1}{2}$) while pushing my way through some thick undergrowth in the forest near La Vega.

14. EUPHONIA MUSICA.

(Cory, op. cit. p. 61.)

Another species peculiar to the island.

The only time I met with it was very early one morning at La Vega on May 2, when I discovered a pair sitting on a dead branch at the top of an alligator-pear-tree. I brought both of them to the ground with a shot from my walking-stick gun, but unfortunately only recovered the male (length $4\frac{1}{2}$ inches, stretch $7\frac{3}{8}$). The testes were very small. My specimen differs from the plate in Cory's book chiefly in having the slate-blue colour on the back of the head and neck much less perceptible.

15. PHONIPARA ZENA.

(Cory, op. cit. p. 63.)

This common and cheery little bird is to be found everywhere along the roadsides and in the clearings, flying up onto the wire fence or a branch as you draw near and uttering its peculiar little long drawn-out twitter or trill, beginning on a high note and ending on a lower, reminding one of the note of our Wood-Warbler (*Phylloscopus sibilatrix*), but uttered much quicker.

I saw several nests of this species towards the end of June, built like our Willow-Warbler's (*P. trochilus*), but *minus* the lining of feathers (another point of similarity between it and *P. sibilatrix*), and placed conspicuously in the tufted head of spines on the top of a pineapple. The eggs resemble those of *P. sibilatrix* in size, but are marked with pale rust-coloured spots and blotches at the large end.

16. LOXIMITRIS DOMINICENSIS.

(Cory, op. cit. p. 67.)

This species locally, by a few of the natives, is called "Canario," the "Canary"; it is a magnificent bird, peculiar to San Domingo. I several times heard it in the dense forest near La Vega, but, owing to its shyness, it was some time before I could identify it.

It has a beautiful flute-like song, but slower and not to be compared with the Canary for variation. On June 3, after a

very stealthy stalk, I had the pleasure of watching one singing for several minutes before I shot at and missed or lost it. In the densest parts of the forest the odds are very heavy against finding a small bird when shot, even those with gaudy plumages.

A week afterwards I saw another not quite so brightly marked, which I believe to have been the female, near the same spot.

17. *LOXIGILLA VIOLACEA*.

(Cory, op. cit. p. 69.)

On Feb. 25 I shot, high up on the hills at the back of Sanchez, among dense large growth, the only specimen I saw of this species, a male, in which the testes were the size of peas. The gizzard, which was a very muscular one, contained stones and broken, black, hard seeds with yellow pulp.

18. *ICTERUS DOMINICENSIS*. Locally "Segua calandra."

(Cory, op. cit. p. 71.)

An Icterine peculiar to the island and interesting in many ways. It was very common, and sometimes to be seen in flocks of 20 or 30. At La Vega all through the day I could hear the loud monotonous chirp of these birds while feeding in the pitch-tree close to the house. This tree has large leaves, like a *Euphorbia*, and a dozen birds might be feeding in it, but not one be visible, so fond are they, I suppose, of the shade of the leaves. Sometimes they would sing very prettily—a quick, high-pitched, musical little warble.

But occasionally I would hear from this tree quite a different song, composed of several loud notes, and on going out all I could find would be a "Segua" in the uniform yellowish-brown plumage of the young bird (according to Cory). This puzzled me a good deal, and I came to the conclusion that there must be two different species. At last, however, on May 24, I shot one of these brownish birds, evidently in a transitional state between that and the black-and-yellow plumage, in the act of singing this loud song, and on dissection it proved to be a young female. This rather added to the mystery at the time, for I was

forced to the conclusion that the young females were able to sing as well as the old males, and, what is more, quite a different song. I think now that there can be little doubt of this rather extraordinary peculiarity, for upon looking up the subject I find that Maynard, in his 'Birds of Eastern North America,' mentions the same thing in connection with the Baltimore Oriole, with some still more extraordinary additions; and in a paper in the 'Field Columbian Museum, Chicago,' vol. i. no. 1, on the "Ornithology of San Domingo," by Mr. George K. Cherric, he says:—"Males and females are alike in plumage, and both sing;" and he goes on to say, "One individual that I secured, while but slightly wounded, gave a splendid exhibition of its powers of song, as a result of, or under the influence of, excitement and pain. A native boy I had with me begged to have the bird, and for several hours, while he was carrying it in his hand, the little creature sang almost continuously." As Cassin, Cory, and others seem to have studied the Icteridæ pretty closely, it is hardly probable that there can still be two species in San Domingo, although several varieties have been described.

The following specimens were obtained:—Sanchez, Feb. 12, an adult (length $7\frac{1}{4}$ inches); Feb. 29, an adult male (length $8\frac{1}{4}$ inches), in which the testes were small. La Vega, April 17, an immature male in which the beak and feathers on the forehead were caked with some brown stuff, which I took to be the pulp of the cacao-seeds; May 9, an adult male (length $8\frac{3}{4}$ inches, stretch $11\frac{1}{4}$); May 24, an immature female (length 8 inches, stretch 10), the one mentioned above; and on June 4 a young male nestling (length $6\frac{1}{4}$ inches, stretch $10\frac{1}{4}$).

The stomachs in all the specimens I examined were practically empty, which rather surprised me, as I shot them in the act, as I thought, of feeding.

19. QUISCALUS NIGER.

(Cory, op. cit. p. 73.)

This species, locally "Chinchilling," a name which well describes the note of the bird, which is musical and bell-like. It is peculiar to the island, and, like the American Grackles, is interesting on account of its ability to ap-

proximate the feathers in the two lateral halves of the tail, the outer ones moving upward, and the inner ones, which are longer than the outer, coming together and forming a vertical rudder, like that of a boat, by which the bird steers to a nicety.

This species puzzled me a good deal as regards its connection with the nests of the *Dulus*. Just by the house in which I lived at Sanchez was a cluster of palms which contained a colony of Palm-Sparrows, and at intervals during the day, the whole time I was there, from January to April, the fierce cries of the Sparrows were mingled with those of the tinkling Chinchilling, sometimes apparently in mortal combat. For some time I fancied they must be breeding in the nests of the Sparrows, but the natives informed me that they built nests of their own quite different from the Sparrows' later in the year.

When I had watched them many times and had become more acquainted with them, I found that they visited the Sparrows' nests almost every morning and robbed them of any eggs they could find.

The stomach of a female (length $10\frac{3}{4}$ inches, stretch $14\frac{1}{2}$) which I shot at Sanchez on March 14 contained the remains of large spiders.

+ 20. *CORVUS LEUCOGNAPHALUS*.

(Cory, op. cit. p. 74.)

Common in the morass on the Yuna river where there are large trees. Their noise can be heard a long way off when a number are collected together. The note in itself is very peculiar, and appears to be compounded of a half musical cackle and a whistling kind of laugh, but sometimes it is harsh and discordant. It is one of the most strange noises I have ever heard from any bird. I shot several, but was unable to procure a specimen for skinning, for, like the Parrots, they invariably settled on the top spike of the palms, and when shot fell into the spreading leaves beneath.

+ 21. *TYRANNUS DOMINICENSIS*. Locally "Petigary."

(Cory, op. cit. p. 77.)

The memory of these birds is not pleasant. Their shrill

ceaseless notes are very irritating and prevent all sleep after daybreak, and often earlier, if they happen to be in the vicinity of the house. I saw several nests, each with young, in June. They were astonishingly small flat structures of just a few twigs placed crossways on each other, and all situated at the extremity of a horizontal branch some 6 or 10 feet from the ground. These birds are very pugnacious. At La Vega I saw a boy fairly defeated in an attempt to rob a nest, although six or seven other boys were throwing sticks and stones from below to keep the birds off him. The Petigaries flew at his head and hit him with their wings, and rustled up and down a branch within a few inches of his face, with crest and feathers ruffled, shrieking all the while in a most ferocious manner, until the boy got frightened and retreated.

+22. *MYIARCHUS DOMINICENSIS*. Locally "Maroa."
(Cory, op. cit. p. 79.)

Another species peculiar to the island. The only specimen I procured of this Flycatcher, although I observed it several times, was a female (length $6\frac{7}{8}$ inches, stretch $10\frac{1}{2}$) on March 26 at Sanchez. Its stomach was full of small black and green beetles only.

+23. *CHORDEILES MINOR*.
(Cory, op. cit. p. 85.)

In July, at La Vega, about an hour or more before sunset, these birds sometimes appeared in considerable numbers, generally when it was or had been pouring with rain. At one time I counted as many as nine, hawking together in the pouring rain round a large tree in the open until it was too dark to follow their movements. Their peculiar note is very distinctive, and generally uttered when they first appear and are flying high. When it is very dull and wet they fly low, backward and forward between the houses, with their characteristic butterfly-like flight, and the big white spot on the primaries showing like a hole in each wing. I was never able to see what they were catching, but the natives say they feed on mosquitoes. One was brought to me in a

decomposed condition from near the railway-station, where it was said to have flown against the telegraph-wires.

+ 24. *CYPSELUS PHENICOBIUS*.

(Cory, op. cit. p. 87.)

+ 25. *NEPHECETES NIGER*.

(Cory, op. cit. p. 88.)

There were two species of Swifts common at La Vega, but the larger one was by far the commonest and gathered in vast flocks towards the evening in wet weather to feed over the waste ground just outside the town.

I did not collect any specimens.

26. *LAMPORNIS DOMINICUS*. Locally "Soombador."

(Cory, op. cit. p. 90.)

I observed this species only twice, although Cory says it is very abundant—once at Samaná, and again on the hills near La Vega. I failed to obtain a specimen.

+ 27. *SPORADINUS ELEGANS*. Locally "Soombador."

(Cory, op. cit. p. 93.)

This Humming-bird was fairly common both at Sanchez and La Vega. A pair frequented the garden almost every morning during March, sometimes probing the flowers of the magnificent scarlet hibiscus and sometimes hovering round the spikes of the large aloes in front of the veranda.

+ 28. *MELLISUGA MINIMA*. Locally "Soombador."

(Cory, op. cit. p. 92.)

This diminutive little Humming-bird, not much bigger than a bumble-bee, was common both at Sanchez and La Vega, and I found several of its nests. One, at the end of March, near Sanchez, containing two young ones, was a tiny cup-like structure placed between the fronds of a small fern on the bank of a stream, lined and chiefly made of wool and fine hair, and disguised outside with little pieces of green moss, lichens, and cobwebs. At the beginning of March I had a nest sent to me from La Vega containing two full-grown young ones.

The noise this little tiny creature can make is quite extra-

ordinary. Perched on a dead branch at the top of a big tree in the forest, turning his head from side to side, he sings, for 5 or 10 minutes at a stretch, a loud, high-pitched, discordant, disconnected little song, which can be heard a hundred yards or so away. This species was much more common among the larger forest growth, and I seldom observed it in the garden, like *Sporadinus elegans*. Although about the smallest of all the Humming-birds, it makes the most incredible humming noise with its wings when flying, or at least when hovering. Often one hears the humming overhead in the forest, much louder than any bee, but it is not so easy to catch a glimpse of the bird; in fact, its movements are often too quick for the eye to follow.

+ 29. TEMNOTROGON ROSEIGASTER.

(Cory, op. cit. p. 95.)

A bird peculiar to the island, and, although rare and local, well known to the natives at La Vega, not on account of its magnificently gaudy plumage, which they say has seven colours, but owing to some superstition connected with it. At the same timen one of them agreed as to the details of that superstition.

They say it is to be found only on the mountains above Harabajoa, some 20 miles or so south-west of La Vega. I was not fortunate enough to obtain a specimen. The Governor of La Vega kindly sent some men to shoot me one, but owing to a bad attack of fever I had to leave before they returned, and I heard afterwards that they came back empty-handed.

The natives round La Vega knew nothing specially of the note of this bird, nor did they seem to know anything of the "Musician" (*Myiadectes montanus*) mentioned by Mr. Cory as inhabiting the tops of the mountains, possessing a magnificent song, and as being looked upon by the natives with dread owing to the superstition that he who saw one would shortly die.

This was the only bird I heard of in San Domingo to which any superstition was attached.

+ 30. SAUROTHERA DOMINICENSIS.

(Cory, op. cit. p. 98.)

Locally "Pajaro bobo" or the "Silly bird," apparently because, when one stops to observe it, the bird, instead of flying away, remains in the bush or tree and can be easily killed.

It is another species peculiar to the island and common wherever I went. The natives say it feeds on lizards; but the stomachs of both specimens which I skinned (males, on April 4) were full of big green grasshoppers.

Its loud cry is easily confused at first with that of the "Boojaro" (*Ædicnemus dominicensis*); but sometimes in the mango-trees it makes a deep croaking noise.

-- 31. CROTOPHAGA ANI. Locally "Hoodōo," "Black Witch."
(Cory, op. cit. p. 100.)

Seen once or twice at Sanchez, but very common at La Vega, usually in flocks of 10 or 12 in the clearings where cattle were feeding. There were no cattle at Sanchez. The peculiar knife-blade shape of the upper mandible in this bird, I think, must be to enable it to separate the small blades of grass and so hunt more easily for beetles and insects. The stomach of a female (length 14 inches, stretch $16\frac{1}{2}$) which I shot at La Vega on May 6 was full of insects, beetles, and grasshoppers. All the specimens I handled had a most abominable smell, both in life and even after the skin was prepared.

In two large trees standing in a small savanna near a railway station on the line to La Vega, I was shown two large nests built of sticks, which were said to have belonged to this species. The native who pointed them out to me said they were years old and had been forsaken on account of the railway being so near. He also assured me that each nest belonged to quite a number of birds, which I find now may have been the case.

Some eggs, said to have been those of the Black Witch, were sent to me early in July at La Vega. They were large, I thought, for the size of the bird, nearly round, of a greenish-

blue colour, and had a thin, rough, chalky shell. The habits and manner of this bird are very peculiar, and its cry is most distinctive, reminding one of the mew of a cat or a Common Buzzard (*Buteo vulgaris*).

32. CERYLE ALCYON. Locally "Rejongo."

(Cory, op. cit. p. 103.)

This was a familiar bird during June along the Yuna and in the creeks amongst the mangroves at the head of Samana Bay. When out shooting Ibis or Duck I was often startled by its loud rattling scream. The stomach of one (length $12\frac{1}{2}$ inches, stretch $20\frac{3}{4}$) shot on March 7th was full of the remains of small crabs.

33. TODUS SUBULATUS.

(Cory, op. cit. p. 105.)

A common and most grotesque-looking little bird, peculiar to the island, and locally called by the natives "Barrancoli," but by the negroes "Robin Redbreast."

At first sight it resembles a small European Kingfisher, and, in fact, in structure and mode of life it is almost identical with the Kingfishers, except that it feeds on insects instead of fish. I have often noticed that it is invariably seen or heard in the immediate vicinity of water, and, like the Kingfisher also, it breeds in a hole dug by its own energies in some soft bank at the side of a stream or roadway.

In walking through the forest I often stopped to identify this little creature, and to listen to its most extraordinary noises.

When first approached it makes a noise easily mistaken for the grunting of some pigs, which are common in the forest, and at intervals snapping its enormous ungainly bill, loud enough to be heard some distance off. Its commonest note is a loud chirping, not unlike the early spring note of our Chaffinch, with one or two variations, getting louder and more excited as one remains, and yet all the time sitting stock-still on a branch with its feathers puffed out, its head sunk between its shoulders, its beak stuck up in front looking far too heavy for it, and its back so exactly the colour of the surrounding foliage that it is most difficult at first to see it.

I examined several breeding-holes of this little Tody, one of which contained young. These excavations were not bored straight into the bank, but turned off to the right or left for about a foot or eighteen inches. I could not judge by any impressions left in the earth whether they were excavated by the feet or the bill or both; but it will be noticed that the feet are exactly like those of a Kingfisher.

Of several specimens shot, one (Sanchez, Feb. 10) measured $4\frac{1}{2}$ inches, another (Feb. 29) $4\frac{5}{8}$ inches in length.

+34. CENTURUS STRIATUS.

(Cory, op. cit. p. 111.)

Locally "Carpentéro," or the "Carpenter Bird," a species peculiar to San Domingo, and quite one of the commonest birds in the island.

It is most destructive, for in some districts it is difficult to find a palm-tree which is not riddled with holes, and yet the wood of these trees is so hard that it is not easy to make an impression on it with a penknife. They not only bore into the palm-trees but into the houses, and make great havoc with the telegraph-poles, besides destroying great quantities of cacao (chocolate) by boring into the half-ripe fruit. I do not remember to have seen a boring in a cocoanut palm, but always in the royal palms.

Governor Anderson, of Sanchez, told me quite seriously that twice he had received orders from the President of the Republic to have all the Carpenteros shot (the dirty ragged soldiers are sure to get into mischief if they are not shooting somebody or something), which orders he had executed; but they were still to be seen in hundreds, and their noisy cries resounded on all sides. Some of their holes are within three feet of the ground.

At Sanchez, on Feb. 27, I took a clutch of four slightly-incubated eggs of this Woodpecker from a hole eighteen inches deep, about eight feet from the ground. The four eggs varied a good deal in size, measuring $24\cdot5$ – $26\cdot5 \times 18\cdot0$ – $19\cdot0$ mm.; their colour is porcelain-white, but they were plastered with dirt from the bottom of the wet hole.

An adult female (length $8\frac{1}{2}$ inches, stretch 14), shot at

La Vega on April 4, had a large quantity of long, stiff, thin, round worms in the peritoneal cavity, and also in the cellular tissue on each side of the neck, reaching with the backward prolongations of the hyoid right up as far as the forehead.

435. *CONURUS CHLOROPTERUS*.

(Cory, op. cit. p. 113.)

I saw several small parties of this Paroquet, making a great squeaking as they flew overhead as I returned from shooting up the river Yuna; but I was never able to obtain a specimen. It is, I believe, very local. This and the following species are both peculiar to the island.

436. *CHRYSOTIS SALLÆI*. Locally "Cotōro."

(Cory, op. cit. p. 115.)

This Parrot is common in San Domingo. Round Sanchez it was to be met with at every turn, flying out of its nesting-hole in some old palm-tree or in small parties overhead, waking the echoes with their screeches.

I can testify from personal experience that the flesh of this Parrot is very good eating, and it is much esteemed by the natives, whom I often met coming home with a string of half a dozen or more shot with their old muzzle-loaders.

At times at Sanchez these birds afforded first-rate sport, for they flew with the greatest regularity from their breeding-haunts among the palm-trees in the swamp to the rice-fields and other feeding-grounds eastward, and back again in the evening, making all the way more noise than a flock of geese. When in returning they found a strong wind against them they were obliged to fly directly over the town, and low down to get the shelter of the hills, so that one only had to take one's stand on the veranda, or behind a palm-tree, or, better still, between two houses, and shoot as they passed over. But shooting was extremely difficult, owing to the high wind, the speed at which the birds flew, and the suddenness with which they rose to a higher level the instant they caught sight of a man.

+37. RUPORNIS RIDGWAYI.

(Cory, op. cit. p. 121.)

Several times while shooting up the Yuna river I saw what I took to be this bird, but I was unable to procure a specimen.

+38. FALCO COLUMBARIUS.

(Cory, op. cit. p. 123.)

One afternoon while sitting in a mangrove-swamp at the head of Samaná Bay trying to endure the torture of the sandflies and mosquitoes, in the hope of getting a shot at some Ibises, I had the pleasure of watching for some time through my glasses one of these little Falcons, a male and the only one I met with, flying off and returning several times to the dead branch of a tree some 80 yards away.

+39. CHAMÆPELIA PASSERINA. Locally "Rollita."

(Cory, op. cit. p. 127.)

This little Ground-Dove was very common at La Vega. I found several nests with eggs or young towards the end of June, beneath tufts of grass in the clearings. When feeding on the ground they are very tame and it is easy to approach within a few feet of them. They get very fat and are good eating. I found it most difficult to make a good specimen owing to the thinness of the skin and the loose attachment of the feathers.

The crop of a male (length 6 inches and stretch $9\frac{1}{2}$) which I shot at La Vega on April 9 was full of dry, round, flattish, brown seeds. Two ova in a female (length $6\frac{3}{4}$ inches and stretch $9\frac{1}{2}$), shot on May 7 at La Vega, were larger than peas.

+40. ZENAIDURA CAROLINENSIS.

(Cory, op. cit. p. 129.)

I met with this bird at only one place, where the railway crosses the Camoo river, about 3 miles east of La Vega. There, on May 10, I saw a dozen or more feeding about the line, and I shot two specimens, a male and a female, both immature.

41. GEOTRYGON, sp. inc.

Abundant in the forest on the hills at Sanchez. Generally to be met with by twos or threes feeding on the ground; but difficult to shoot, as one catches only a momentary glimpse of the birds as they fly silently and quickly through the undergrowth. I never saw them fly up into trees. I was shown several old nests placed on stumps of trees or matted creepers near the ground.

Although I shot several of these Pigeons, I omitted to preserve a specimen, owing to want of time; hence I am uncertain whether they were *Geotrygon montana* or *G. martinica*.

+42. COLUMBA INORNATA. Locally "Palōma."

(Cory, op. cit. p. 136.)

At the head of Samaná Bay there are well-recognized Pigeon months, June, July, and August, and during these months the natives make almost daily excursions from Sanchez to the mangrove-swamps, where the Pigeons are in tens of thousands. They load and fire as fast as their antiquated muzzle-loading appliances will permit, and come home sometimes with their boat literally laden with Pigeons, which they sell for 10 cents per couple. These are delicious eating at this season if properly cooked.

I made several excursions into the swamp after Pigeons, and one day, June 25, I shot as many as 120, mostly on the wing, in about three hours. It is only necessary to put on a pair of waders or top-boots and take one's stand in the best open space one can find among the tallest mangrove-trees. After a dozen or so have fallen, some shot as they fly over and others as they settle for a moment on the tops of the trees, the most difficult work of the day begins, that of wading round to look for them. Unless a native is employed to retrieve them, one has to climb through the network of wet and slippery aerial mangrove-roots, sometimes sinking into the black mud and water up to one's middle, while legions of small crabs, and some big ones with legs a foot long, recede and disappear behind each root or up each stem

as one approaches, to say nothing of the clouds of sandflies and mosquitoes.

When all that can be found are picked up one returns to one's post, and the shooting goes on once more, till sufficient are shot again to make it worth while to collect them.

— 43. *ÆDICNEMUS DOMINICENSIS*. Locally "Boojaro."

(Cory, op. cit. p. 140.)

This bird I only saw once in the wild state as I was riding across the Savana Grande near Almaeen; but I believe it is pretty common. Many natives and others keep them in their houses or enclosures to feed upon the cockroaches &c. They much resemble at first sight the Stone Curlew (*Ædicnemus crepitans*). Their cry is very loud and often uttered at night; it is a series of quickly repeated notes, running down the scale, the last notes lower and slower than the first.

44. *TRINGOIDES MACULARIUS*. Locally "Fleidicito."

(Cory, op. cit. p. 148.)

Very common; I observed it many times round Sanchez, on the beach, in the mangrove-swamps, and up the river Yuna.

A male I skinned Feb. 28 measured $7\frac{1}{2}$ inches in length.

+ 45. *ÆGIALITIS VOCIFERA*.

(Cory, op. cit. p. 141.)

Three times at La Vega, and once at Puerto Plata in July, while riding across small savannas, I met with a pair of beautiful Plovers which I took to be *Æ. vocifera*; but, as I obtained no specimens, I never was quite sure of their identity.

In two instances they evidently had eggs or young. They acted much like a pair of noisy Golden Plovers (*Charadrius pluvialis*), calling from hummocks, or running along the ground, or getting up and flying round excitedly, making a deal of noise.

+ 46. *EUDOCIMUS ALBUS*.

(Cory, op. cit. p. 150.)

This bird, locally named "Koko," on account of its arti-

culating these syllables in a sepulchral voice when surprised while feeding in the dark and silent mangrove-swamps, was very common up the rivers Yuna and Baracota, at the head of Samaná Bay. The natives shoot them to eat, but the flesh to my mind has a disagreeable flavour.

Of all flight-shooting that I have experienced I think the White Ibis affords the best. Several times while at Sanchez I rowed over with two companions, and a native boy to act as retriever, to one of the mouths of the Yuna, reaching there just before dusk. As soon as we had chosen a partly-concealed place for the boat, where we could command a view of open water on both sides of us, so as not to lose any birds in the mangrove-bushes, the Kokos and Ducks began to come over in small parties to feed on the mud, affording us some splendid shooting, the Kokos flying slowly and silently, the Ducks swiftly and whistling. In the half-hour before darkness set in we often had secured 10 or 15 Ducks and perhaps 30 or 40 Ibises, besides other birds.

A young male I skinned on Jan. 28th measured—length $25\frac{1}{2}$ inches, stretch $30\frac{1}{2}$.

⊥ 47. TANTALUS LOCULATOR.

This species was not common; but I gathered from the natives and others that there were always a few to be seen in the morass at the mouth of the Yuna.

At the end of June, while on a shooting expedition in this morass, I saw five of these birds about half a mile off perched on a tree covered with matted creepers. They very soon rose, and rather to my surprise circled high up into the air. We several times during that day saw single birds, and once I obtained a long shot at one flying over, but without result. The boatmen called them the "Faisan." What the word meant they could not tell me; but it seemed to have some connection with the bare vulture-like head and neck of the bird.

⊥ 48. ARDEA CÆRULEA.

(Cory, op. cit. p. 154.)

This is by far the commonest of all the *Ardeæ* that I met

with. In the swamp at Sanchez it was to be found in hundreds. On my shooting-trips up the river it was a constant companion, flying up within shot at every few yards. Tame and confiding, it often let the boat pass within 20 feet of it. It gave sometimes a feeble heron-like squeal. When I first saw this bird I could hardly believe that the slaty-blue ones belonged to the same species as the white; but they were always together, sometimes in flocks of 15 or 20 feeding in the swamp, and their habits seemed similar, except that the white ones were certainly more confiding than the blue; but if the white ones are the young of the blue, this might be expected. It seemed easier to believe that they were male and female and not old and young, for I never once, out of many hundred birds, saw one with a distinctly intermediate plumage. It was far more common to see a pair of white and blue ones fly up together than it was to see two blue ones, and I counted to see whether the white or the blue were the commonest, and found them about equal. I was sorry not to have had more time in which to have studied them.

+ 49. ARDEA VIRESCENS.

(Cory, op. cit. p. 155.)

This species, though common, was far less so than the preceding. I seldom saw more than one at a time, and this one was generally sitting stock-still on a branch or a stump, near the water-level, with its head sunk deep between its shoulders, showing no signs of its long neck.

Suddenly, as the boat drew near, the bird's head appeared to be flying off without the body; but the wings opened and the bird followed, seemingly twice as long as it was before, and, waking the echoes with a loud, harsh, angry screech, would settle behind some bushes and peer over the top with its outstretched neck until the boat had passed.

A gentleman on the staff of the railway at Sanchez on the 18th June gave me a graphic description of a heronry belonging to this species which he had seen the day before, on a little island not 30 feet in diameter which I had visited more than once early in the year at the mouth of the Baracota

river. There were about 16 nests in the trees and on the mangrove-bushes, many of them with eggs, which he described as blue. Those which were destined for me got broken in transit.

+50. ARDEA EGRETTE. Locally "Galca-real" or "Royal Heron."

A common bird in the Yuna swamp, but observed nowhere else. It was not very easy to approach, but I shot several specimens with No. 4 shot at long distances. It is really easier to bring down than almost any other large bird, for if one single shot so much as touches the wing-bones they splinter at once, being large thin tubes of compact bone filled with air. Hence the graceful flight of the bird, its buoyancy enabling it to settle slowly and easily, and when rising one beat of its wings makes it bounce into the air like a toy-balloon.

The usual attitude of this bird is markedly rectangular, and has none of the beautiful curves of neck and body invariably shown in plates and stuffed specimens. It stands with its body almost upright, its long thin neck rising as straight as a stick perpendicularly from the shoulders, and its head and long beak exactly at right angles to its neck. It is impossible for it to bend its neck in graceful curves, for each individual cervical vertebra is 2 inches or more long. The pectoral skeleton is surprisingly small and fragile for the size of the bird. The anterior border of the sternum is very deeply notched to receive a coil of the trachea, and the furcula is jointed closely to the sternum, evidently so that it should not press upon the coil of trachea above. I do not remember to have heard this species make any noise.

It seemed always to feed alone, and not in company like *A. cærulea*.

The Galca breeds early, for on Feb. 18 I made a trip to the Baracota, another river which falls into the head of Samaná Bay, on board the steam-tug belonging to the Railway Company. On coming out of the mouth of the river we had to hug the south shore of the bay, and passed

a picturesque, high, rocky coral island, covered with large trees thickly hung with luxuriant creepers. These trees were occupied by a heronry of some hundred or more birds of this species. Through my glasses I could make out many nests, some with the birds sitting upon them, while other birds were grouped about the trees, making altogether a picture not to be forgotten. I could not land, and did not get a chance of visiting the spot again. The long plumes of this Egret are occasionally sent by the merchants of Sanchez to New York for sale, and are said to realize a high price.

† 51. NYCTIARDEA NÆVIA.

I met with this species many times in the Yuna morass. The only specimen I preserved was an immature bird, which I shot one evening as it flew over in the twilight while I was flight-shooting in the Yuna delta.

† 52. NUMIDA MELEAGRIS. Locally "Guinëa."

The Guinea-hen is a common bird in San Domingo, both in the domesticated and wild state. Occasionally in the drier parts of the Yuna swamp a covey of these birds, very wild when on the wing, afforded me good sport. The wild birds seemed smaller and much blacker than the tame ones.

53. ERISMATURA, sp. inc. (?). Locally "Pato."

The chief aim of several of my never-to-be-forgotten excursions into the morass at the mouth of the Yuna was ducks, and ducks we found in hundreds.

It was easy to discover them, often long before we first sighted them on some open patch of water perhaps a quarter of a mile away, by the whistling that they kept up; and by all of us kneeling down in the boat, except the man whose duty it was to scull her along, we soon managed to get within shot. After packing together and swimming away for a while, the Ducks would begin to rise, those nearest first. Then was the orthodox moment, and we emptied our barrels into them. Well do I remember my astonishment, on the first of these trips, to see the greater part of the Ducks remaining on the water after we had fired, instead of rising in a body. They seemed to be dazed and demoralized,

swimming about for some minutes, and then getting up and flying in all directions, affording us, after partially sheltering the boat amongst the rushes, half an hour's excellent sport. They were, however, difficult to recover, and we lost a great number, for, if only a spark of life was left in them, they dived and we saw them no more. Our bag that first day was 74. They are very good eating. On these excursions I found a pair of long fishing-waders invaluable.

I did not meet with more than this species of Duck and the Garganey (*Querquedula discors*), although the natives told us there were several other sorts in this morass. Nearly all those I shot of the present sort were immature, and I was never quite satisfied as to the species. Owing to the loss of the only two skins which I made, from the ravages of white ants, in San Domingo, I am unable to establish its identity.

†54. QUERQUEDULA DISCORS.

(Cory, op. cit. p. 168.)

Seen and shot several times in the Yuna swamp, but not common.

55. PELECANUS FUSCUS.

(Cory, op. cit. p. 172.)

The first bird to be seen on entering Samaná Bay, and the last to be seen on leaving it. One morning I watched fully 600 of these great birds, after a gale from the east, diving for fish at the head of the Bay. They breed in a large colony on a rocky promontory and some islands, called the "Pelican cays," on the south side of the Bay, but I was never able to visit the place.

56. TACHYPETES AQUILUS.

(Cory, op. cit. p. 173.)

I observed this rakish-looking bird, with its enormous stretch of wing, several times in Samaná Bay, usually at a great height.

I do not think it breeds in the Bay.

57, 58. Of Gulls also I observed only one species, and only

one species also of Terns. They were neither of them common, and I did not succeed in obtaining specimens.

†59. *PODICIPES DOMINICUS.*

(Cory, op. cit. p. 185.)

In July, while shooting in the Yuna swamp, I several times obtained a good view of this little Grebe. It was very shy, and always dived or swam into the rushes on the first appearance of the boat.

XXVI.—*On some Fossil Remains of Carinate Birds from Central Madagascar.* By CHAS. W. ANDREWS, B.Sc., F.Z.S., Assistant in the British Museum (Natural History).

(Plates VIII. & IX.)

DURING his recent visit to Madagascar, Dr. Forsyth Major spent several months at Sirabé, in the centre of the island, a district well known for the abundance of fossil bones to be obtained there. A large number of excavations, most of them of considerable depth (12–15 ft.), were made, and a very fine collection of the remains of the extinct species of *Hippopotamus* and other mammals, of several species of *Æpyornis*, and also of numerous carinate birds was made. The present paper deals only with the last, which are mostly aquatic birds, though bones of a Rail and a Hawk also occur. By far the greater number of specimens were obtained from a depth of from twelve to fifteen feet in a marly layer, which Dr. Major believes to have been deposited on the bed of an old lake. Above this comes a layer of coarse gravelly character, consolidated with carbonate of lime and containing rolled and broken bones; this probably marks a volcanic outburst, accompanied by the breaking forth of numerous hot springs charged with carbonate of lime. Above this deposit there is another, about five or six feet in thickness, of black earth, in which also bird-bones occur, though comparatively rare.

In the marly layer the carinate remains are found in association with those of a rather small species of *Æpyornis*, the